ORIGINAL RESEARCH PAPER
Volume-7 | Issue-2 | February-2018 | PRINT ISSN No 2277 - 8179
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

GRID COMPUTING AS AN INNOVATIVE SOLUTION FOR DIGITAL LIBRARY MANAGEMENT SYSTEM

Information Technology

Dr M Murugesan Librarian, MIET Engineering College, Trichy – 07

ABSTRACT

Grid computing is rabidly emerging as the dominant paradigm for wide area distributed computing. It is a goal to provide a service to enable pervasive access to and coordinated resource sharing of geographically distributed software, hardware and information resources. Grid computing technology offers an innovative solution for digital library. Therefore corresponding research about integrating digital library management system into grid computing technology is started in recent years. The research objectives are mainly focusing on why we do need grid computing technology and its essential benefits to the digital library management systems. The paper designs a solution to the digital library management system based on grid computing, including User-Level module, Grid-layer module, Semantic Web module and Digital Library module four parts. The proposed innovative methodology brings many advantages and solutions to the digital library management systems.

KEYWORDS

Grid Computing, Digital Library, Coordinated Resource Sharing, Semantic Web Module

1. Introduction:

Modern applications are demanding more and more computational which cannot be satisfied by the existing individual computers. In order to meet these computational challenges, it is necessary to have a standardized means of connecting disparate digital resources over high speed networks to build high power virtual supercomputers. Digital resources marketplace has become larger and more global by a large amount of digital content data. Digital resource suppliers have to provide any digital content, anytime and anywhere with a mass storage and a large-scale database system. Digital library management system based on grid computing is becoming the new issue to processor processing speed, data storage capacity and network performance that provide efficient and smooth management, monitoring and information exchange of distributed resource networks with diverse widespread sources of information. Therefore, this paper proposes the grid computing based digital library management system for providing digital services to grid users more correctly and stably.

2. Problem(s) Description:

Applications show that the majority of grid computing in digital library applications is suffering from many problems, difficulties, and obstacles. Like time consuming, system compatibility, resource availability, systems redundancy and stability, and cost. Thinking in all mentioned problems lead to questions:

- Why we need to change?
- What is the reason(s) of such problems?
- Where these problems might exist/appear?

- When these problems occurred, or when is the deadline to find the solution(s)?

-Which technology, methodology, strategy/ technique to be changed, used/developed?

3. Why Grid Computing?

The following factors either directly or indirectly facilitated the emergence of computational grids

-
- Availability of many PCs and workstations
- Availability of high-speed networks or gigabit Ethernets
- Need to solve large scale computational problems

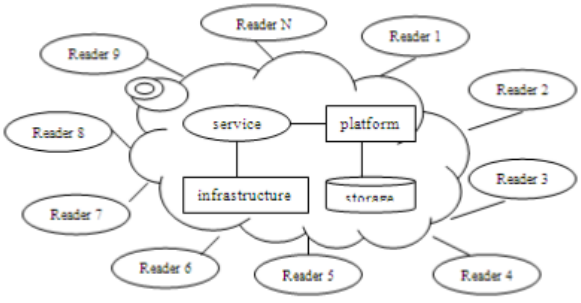
Development of grid computing is motivated by the potential benefits for the specific application. This technology has also its unique characteristics for the application development.

4. Grid Computing Application in Digital Library:

- Hosting library website, backing up media collecting of storage and accessing bibliographic and full text information
- Understand the importance of personalize of WEBOPAC
- Understand converged device are every where
- Understand that the grid may also be valuable information resources.
- Library must transfer effect into higher value activity and embrace the web as the primary technology infrastructure.

5. Library Knowledge Sharing System:

The library knowledge is shared by the reader based on grid computing. There are following aspects to design.



5.1. Architecture System:

Composed of library knowledge sharing system resources is the wide-area scattered based on grid computing. No longer confined to a single library and small scale LAN, but all our country's library or university library knowledge sharing system is established based on grid computing. One can put their knowledge of the production records into the system, forming new knowledge sharing. Grid computing ultimate goal is that linking online knowledge resources can be very convenient shared by any reader anytime.

5.2. Operating System:

Operating system is a program to manage hardware and software resources, also is the kernel and foundation in the computer and net system. The operating system adapted to grid computing can make its application work together with a web browser, but its real calculation process is actually operated in the remote data center

5.3. Use Mode:

In the existing network operating system, teachers and students can use all kinds of software tools installed on their own compute to finish various kinds of education teaching task. But in the grid computing environment, users need through new ways to utilize system resources. Not only are knowledge resources many , but are also expanding at same time the information processing tools is to geometric growth. Thus personal terminal may not have all of the software tools. It can get help from grid computing systems

5.4. Technical Standard:

During library information the essence of grid computing application is the fact that various education and teaching information resources can be shared. But different departments or readers have their own needs. New technology or tools also have appeared gradually in the process of the development .

5.5. Safe Access:

Grid computing technology the biggest challenge of a library is to solve different security access control between departments, integrating resources seamlessly and sharing with cooperation across all fields. If the resource through the internet safely can share and also has mutual redundancy, it can certainly promote the resource use efficiency. This knowledge sharing system must ensure the safety of resource sharing

6. Grid Computing -Based Digital Library Management:

6.1. User-Level Design:

Digital libraries information from various areas is fed back to view layer through interaction with the users. Users can obtain the needed information or then take next step. The visualization of the view layer inquiring results could be accomplished by visual graphics components designed library.

6.2. Grid-layer Design:

Services provided by the data layer digital library is registered at the grid center.

6.3. Semantic Web Design:

Unicode is used to deal with digital library resources and encode them. It is responsible for labeling the digital library web resources and enables each digital library to have their own tag by the adoption

6.4. Digital Library Module Designing:

It provides interoperation that is based on metadata harvesting and can be applied to application program for various digital resource bases. This framework provides for two types of roles, service providers and data providers. Each digital library system will have to issue its own service via web service which can be the simplest inquiring way.

7. Proposed Model for Grid Computing in Digital Library Management System

The proposed model is stating that the grid computing system components are to be integrated directly to the digital library system components. Modern digital library systems are computer enabled which are joining the grid computing system environment.

Grid Computing Model Integrating with Digital Library Management

These computers are behaving are message, data and commands transceiver. These resources can send digital library system information to all joint grid computing resources which already connected to other digital library systems located diversely. This proposed model is bringing two advantages to digital library systems. Changing the centralized digital library system monitoring, controlling mechanism into decentralized mode. This strategy may help with the focus and development to renewable energy resources which have to be geographically widely separated grid computing system may work as a bridge between digital library and computational resources. Among all these innovative solutions and advantages, grid computing power system integration still has many challenges and difficulties

8. Conclusion

Grid Computing as a new distributing computing technology can group all the resource as a virtual computer resource pool and handle geographically distributed system. The study of grid computing is still in the initial stage now impacts brought by grid computing are obvious. With the introduction of grid computing to digital library services of libraries will have a new leap in the near future services provided by libraries will become more user-centric, more professional and more effective, etc. We all believe that libraries will create more knowledge benefits for our country with the help of grid computing.

9. Reference :

1. Joseph, Joshy and Fellenstein, Craig: Grid Computing, New Delhi, Pearson Education, 2009.
2. Wu, Zhaohui and Chen, Huajan: Semantic Grid: Model, methodology and applications. New York , Springer, 2010
3. Sung Ho Jang, Chang Hyeon Noh(2008) Semantic Web-based Digital Content Management in Grid Computing IEEE International Workshop on Semantic Computing and Applications
4. Feng Xiaona (2010) Application of Cloud Computing in University Library User Service Model "3rd International Conference on Advanced Computer Theory and Engineering (ICACTE)
5. Chu, X etal, (2007) Aneka: Next-Generation Enterprise Grid Platform for e-Science and e-Business Applications. In Proceeding of the 3rd IEEE International Conference on e-Science and Grid Computing, Bangalore, India, December 2007.
6. Hongqiang Wang and Damin Zhao, (2010) Library Knowledge Sharing Based on Cloud computing. "2nd International Conference on Software Technology and Engineering(ICSTE)"